Water Quality Research Journal of Canada, 33(1): 31-50 (1998)

Groundwater Contamination by Chlorinated Hydrocarbon Impurities Present in Soil Fumigant Formulations

B.J. Zebarth,[1] S.Y. Szeto,[1] B. Hii,[2] H. Liebscher[2] and G. Grove[3]

[1] Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Summerland, British Columbia V0H 1Z0
[2] Environmental Conservation, Environment Canada, Airport Square, 700 C 1200 West 73rd Avenue, Vancouver, British Columbia V6P 6H9
[3] National Hydrology Research Institute, Environment Canada, 11 Innovation Boulevard, Saskatoon, Saskatchewan S7N 3H5

Abstract

Groundwater contamination of the Abbotsford aquifer by 1,2-dichloropropane (1,2-DCP) was reported previously. The purpose of the present study is to quantify groundwater contamination by other chlorinated hydrocarbon compounds which are present in fumigant formulations containing 1,2-DCP. Widespread contamination of 1,2,2-trichloropropane (1,2,2-TCP) was measured consistent with a non-point source. 1,2,2-TCP concentration generally decreased with depth suggesting a surface source. Localized contamination by 1,2,3-trichloropropane, 2,3-dichloropropene and 1,3-dichloropropane was detected. Detection of these compounds was associated with higher concentrations of 1,2-DCP suggesting contamination by these compounds may have been from the same fumigant sources. The lack of a decrease in the concentration of most of these compounds over time suggests that the measured contamination will persist for some time. The results highlight the potential for persistent trace impurities in chlorinated fumigant formulations to contaminate groundwater in vulnerable aquifers

Key words

1,2,2-trichloropropane, 1,2,3-trichloropropane, 2,3-dichloropropene, 1,3-dichloropropane, 1,2-dichloropropane